Amendments to the Claims:

This listing of claims will replace all prior versions, and listings, of claims in the application:

Listing of Claims:

1. (Previously Presented) A channel quality measurement apparatus adapted to measure a quality of a channel over which has been transmitted a sequence of symbols produced by encoding and constellation mapping a source data element sequence, the apparatus comprising:

a symbol de-mapper, receiving as input a sequence of received symbols over the channel whose quality is to be measured, said symbol de-mapper being adapted to perform symbol de-mapping on said sequence of received symbols to produce a sequence of soft data element decisions;

a soft decoder, receiving as input the sequence of soft data element decisions produced by the symbol de-mapper, said soft decoder being adapted to decode the sequence of soft data element decisions to produce a decoded output sequence;

an encoder, receiving as input the decoded output sequence produced by the soft decoder, said encoder being adapted to re-encode the decoded output sequence with an identical code to a code used in encoding the source data element sequence to produce a re-encoded output sequence; and

a correlator, receiving as input the sequence of soft data element decisions produced by the symbol de-mapper, and the re-encoded output sequence produced by the encoder, said correlator being adapted to produce a channel quality indicator output by determining a correlation between the sequence of soft data element decisions and the re-encoded output sequence.

2. (Original) A channel quality measurement apparatus according to claim 1 wherein the symbol de-mapper is adapted to perform QPSK symbol de-mapping.

3. (Original) A channel quality measurement apparatus according to claim 1 wherein the symbol de-mapper is adapted to perform Euclidean distance conditional LLR symbol de-mapping.

4. (Original) A method of measuring channel quality of a channel over which has been transmitted a sequence of symbols produced by encoding and constellation mapping a source data element sequence, the method comprising:

receiving a sequence of received symbols over the channel whose quality is to be measured;

symbol de-mapping said sequence of received symbols to produce a sequence of soft data element decisions;

decoding said sequence of soft data element decisions to produce a decoded output sequence;

re-encoding said decoded output sequence to produce a re-encoded output sequence using a code identical to a code used in encoding the source data element sequence; and

correlating said re-encoded output sequence, and said sequence of soft data element decisions to produce a channel quality indicator output.

5. (Original) A method of channel quality measurement according to claim 4 wherein the symbol de-mapping of said sequence of received symbols is QPSK symbol de-mapping.

6. (Original) A method of channel quality measurement according to claim 4 wherein the symbol de-mapping of said sequence of received symbols comprises Euclidean distance conditional LLR de-mapping.

7. (Original) A method of measuring OFDM channel quality of an OFDM channel over which has been transmitted a sequence of OFDM symbols, the OFDM symbols containing an encoded and constellation mapped source data element sequence, the method comprising:

receiving a sequence of OFDM symbols over the OFDM channel whose quality is to be measured;

symbol de-mapping said sequence of received symbols to produce a sequence of soft data element decisions;

decoding said sequence of soft data element decisions to produce a decoded output sequence pertaining to the source data element sequence;

re-encoding said decoded output sequence to produce a re-encoded output sequence using a code identical to a code used in encoding the source data element sequence; and

correlating said re-encoded output sequence, and said sequence of soft data element decisions to produce a channel quality indicator output.

8. (Original) A method of OFDM channel quality measurement according to claim 7 wherein the symbol de-mapping of said sequence of received symbols is QPSK symbol de-mapping.

9. (Original) A method of OFDM channel quality measurement according to claim 7 wherein the symbol de-mapping of said sequence of received symbols comprises Euclidean distance conditional LLR de-mapping.

10. (Original) A method of OFDM channel quality measurement according to claim 7 wherein the decoding of said sequence of soft data element decisions to produce a decoded output sequence further comprises using a history of the soft data element decisions, and using information about encoding of the sequence of symbols transmitted over the channel.

11. (Previously Presented) A communication system comprising:

a transmitter adapted to transmit a sequence of symbols produced by encoding and constellation mapping a source data element sequence over a channel; and

a receiver comprising:

a) a symbol de-mapper, receiving as input a sequence of received symbols over the channel, said symbol de-mapper being adapted to perform symbol de-mapping on said sequence of received symbols to produce a sequence of soft data element decisions;

b) a soft decoder, receiving as input the sequence of soft data element decisions produced by the symbol de-mapper, said soft decoder being adapted to decode the sequence of soft data element decisions to produce a decoded output sequence;

c) an encoder, receiving as input the decoded output sequence produced by the soft decoder, said encoder being adapted to re-encode the decoded output sequence with an identical code to a code used in encoding the source data element sequence to produce a re-encoded output sequence; and

d) a correlator, receiving as input the sequence of soft data element decisions produced by the symbol de-mapper, and the re-encoded output sequence produced by the encoder, said correlator being adapted to produce a channel quality indicator output by determining a correlation between the sequence of soft data element decisions and the re-encoded output sequence,

wherein the receiver is adapted to feed the channel quality indicator back to the transmitter, and wherein the transmitter is adapted to use said channel quality indicator to determine and apply an appropriate coding rate and modulation to the source data element sequence.

12. (Original) A communication system according to claim 11 wherein the symbol de-mapper is adapted to perform QPSK symbol de-mapping.

13. (Original) A communication system according to claim 11 wherein the symbol de-mapper is adapted to perform Euclidean distance conditional LLR symbol de-mapping.

14. (Original) A method of adaptive modulation and coding comprising:

transmitting over a channel a sequence of symbols produced by encoding and constellation mapping a source data element sequence;

receiving a sequence of received symbols over the channel;

symbol de-mapping said sequence of received symbols to produce a sequence of soft data element decisions;

decoding said sequence of soft data element decisions to produce a decoded output sequence;

re-encoding said decoded output sequence to produce a re-encoded output sequence using a code identical to a code used in encoding the source data element sequence;

correlating said re-encoded output sequence, and said sequence of soft data element decisions to produce a channel quality indicator output;

transmitting the channel quality indicator; and

using said channel quality indicator to determine and apply an appropriate coding rate and modulation to the source data element sequence.

15. (Original) A method of adaptive modulation and coding according to claim 14 wherein the symbol de-mapping of said sequence of received symbols is QPSK symbol de-mapping.

16. (Original) A method of adaptive modulation and coding according to claim 14 wherein the symbol de-mapping of said sequence of received symbols comprises Euclidean distance conditional LLR de-mapping.

17. (Currently Amended) A method of determining a channel quality comprising correlating a soft data element decision sequence with a second data element sequence to generate a channel quality indicator, the second data element sequence being produced by decoding the soft data element decision sequence to produce a decoded sequence and then re-encoding the decoded sequence.

18. (Original) A method comprising:

applying forward error coding to a signalling message to generate a coded fast signalling message;

MPSK mapping the coded signalling message to produce an MPSK mapped coded signalling message;

mapping the MPSK mapped coded signalling message onto a plurality of sub-carriers within an OFDM frame comprising a plurality of OFDM symbols;

encoding symbols of the MPSK mapped coded signalling message using Differential Space-Time Block Coding (D-STBC) in a time direction to generate encoded symbols; and

transmitting the encoded symbols on a plurality of transmit antennas, with the encoded symbols being transmitted at an increased power level relative to other symbols within the OFDM frame as a function of channel conditions.

19. (Original) A method according to claim 18 wherein the encoded symbols are transmitted in a scattered pattern.

20. (Original) A method according to claim 18 wherein transmitting the encoded symbols on a plurality of antennas comprises:

on a selected sub-carrier, each antenna transmitting a respective plurality N of encoded symbols over N consecutive OFDM symbols, where N is the number of antennas used to transmit, for a total of NxN transmitted encoded symbols, the NxN symbols being obtained from D-STBC encoding L symbols of the MPSK mapped coded signalling stream, where L,N determine an STBC code rate.

21. (Original) A method according to claim 20 further comprising:

transmitting a set of pilot sub-carriers in at least one OFDM symbol;

using the pilot sub-carriers as a reference for a first set of D-STBC encoded symbols transmitted during subsequent OFDM symbols.

22. (Original) A method according to claim 21 wherein transmitting a set of pilot sub-carriers in at least one OFDM frame comprises:

transmitting a plurality of pilots on each antenna on a respective disjoint plurality of sub-carriers.

23. (Original) A method according to claim 22 wherein each disjoint plurality of sub-carriers comprises a set of sub-carriers each separated by N-1 sub-carriers, where N is the number of antennas.

24. (Original) A method according to claim 22 wherein pilot sub-carriers are transmitted for a number of consecutive OFDM frames equal to the number of transmit antennas.

25. (Original) A method according to claim 18 wherein the signalling message contains an identification of one or more receivers who are to receive data during a current TPS frame.

26 (Original) An OFDM transmitter adapted to implement a method according to claim 18.

27. (Original) An OFDM transmitter adapted to implement a method according to claim 20.

28. (Previously Presented) A receiving method for an OFDM receiver comprising:

receiving on at least one antenna an OFDM signal containing received D-STBC coded MPSK mapped coded signalling message symbols;

recovering received signalling message symbols from the OFDM signal(s);

determining from the signalling message symbols whether a current OFDM transmission contains data to be recovered by the receiver;

upon determining the current OFDM transmission contains data to be recovered by the receiver:

a) re-encoding, MPSK mapping and D-STBC coding the received coded signalling message symbols to produce re-encoded D-STBC coded MPSK mapped coded signalling message symbols;

b) determining a channel estimate by comparing the received D-STBC coded mapped coded signalling message symbols with the re-encoded D-STBC coded MPSK mapped coded signalling message symbols.

29. (Original) A method according to claim 28 wherein a channel estimate is determined for each location (in time, frequency) in the OFDM signal containing D-STBC coded MPSK mapped coded signalling message symbols, the method further comprising interpolating to get a channel estimate for remaining each location (in time, frequency) in the OFDM signal.

30. (Original) A method according to claim 29 further comprising:

receiving pilot symbols which are not D-STBC encoded which are used as a reference for a first D-STBC block of D-STBC coded MPSK mapped coded signalling message symbols.

31. (Original) A method according to claim 28 further comprising:

extracting the signalling message.

32. (Original) An OFDM receiver adapted to implement the method of claim 28.

33. (Original) An article of manufacture comprising a computer-readable storage medium, the computer-readable storage medium including instructions for implementing the method of claim 1.

34. (Original) An article of manufacture comprising a computer-readable storage medium, the computer-readable storage medium including instructions for implementing the method of claim 18.

35. (Original) An article of manufacture comprising a computer-readable storage medium, the computer-readable storage medium including instructions for implementing the method of claim 28.

36. (Original) A method of generating pilot symbols from an Orthogonal Frequency Division Multiplexing (OFDM) frame received at an OFDM receiver, the OFDM frame containing an

encoded fast signalling message in the form of encoded symbols within the OFDM frame, the method comprising the steps of:

processing the encoded symbols based in a scattered pilot pattern to recover the encoded fast signalling message;

re-encoding the fast signalling message so as to generate pilot symbols in the scattered pattern;

recovering a channel response for the encoded symbols using decision feedback.

37. (Original) The method of claim 36 comprising the further step of applying a fast algorithm to compute a Discrete Fourier Transform based on the scattered pattern to extract the combined pilot symbols and fast signalling message and only preceding to recover channel response if the fast signalling message indicates a current transmission contains content for the OFDM receiver.

38. (Original) The method of claim 35 wherein processing the encoded symbols comprises:

differentially decoding the encoded symbols using Differential Space-Time Block Coding (D-STBC) decoding to recover the encoded fast signalling message;

applying Forward Error Correction decoding to the encoded fast signalling message to recover a fast signalling message;

analyzing the fast signalling message to determine whether it includes a desired user identification;

if the fast signalling message includes the desired user identification, re-encoding the fast signalling message using Forward Error Correction coding to generate the encoded fast signalling message, and re-encoding the encoded fast signalling message using D-STBC.

39. (Original) A transmitter adapted to combine pilot and transmission parameter signalling on a single overhead channel within an OFDM signal.

40. (Original) A transmitter according to claim 39 wherein a set of transmission parameter signalling symbols are transmitted on the overhead channel with strong encoding such that at a receiver, they can be decoded accurately, re-encoded, and the re-encoded symbols treated as known pilot symbols which can then be used for channel estimation.

41. (Original) A receiver adapted to process the combined single overhead channel produced by the transmitter of claim 40, the receiver being adapted to:

decode a received signal containing the encoded transmission parameter signalling symbols as modified by a channel, re-encode the decoded symbols to produce known pilot symbols, compare received symbols with the known pilot symbols to produce a channel estimate.